

Bad Water vs. Good Health

BY LOUIS EDWARD THEISS

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HOW grossly inconsistent we are! When, for the sake of gain, a Missouri physician administered typhoid germs to some of his relatives, thereby causing six or eight illnesses and one death, we stood aghast, called the physician a murderer, and clapped him into prison for life. And when, during the Spanish-American war, some twenty-five hundred of the boys in khaki were needlessly slaughtered, many of them by typhoid, we denounced in scathing terms those officials whose carelessness and incompetency caused the tragedy. But we hear with absolute indifference the statement that yearly the pollution of our water sources needlessly causes more than 185,000 typhoid illnesses and 15,000 deaths. We pay no heed to the fact that year after year in the United States seven times as many people are needlessly ill of typhoid fever as there were soldiers wounded in the battle of Gettysburg, and three times as many persons needlessly die from typhoid fever as met death in that tragic struggle.

It is the old, old story of the mote and the beam. We do not see the enormity of this terrible wrong, because we are ourselves the authors of it. We are just as responsible for those 15,000 yearly deaths as our army officers were for the tragedies in our Spanish war camp. And our motive is just as mercenary as was that of the physician who gave typhoid germs to gain a heritage. For we, too, are actuated by financial reasons: we are unwilling to pay the price of water purification. So we continue to smite the rock of a polluted water supply and there gushes forth sewage. And when our children ask for water we give them poison.

To be suitable—that is, to be potable and fit for domestic use—water must be practically free from pathogenic germs, color, sediment, odor, taste and turbidity. Hardness makes laundering difficult. Iron spoils linen. Carbonic-acid gas turns water pipes brown. Algae make water taste bad. Water supplies differ widely as human beings. "Pure, wholesome water," the term set forth in so many water contracts, is, then, wholly a relative term. Really pure water is a rare thing, because there hardly exists in nature water that does not contain some foreign ingredients. Not all of these are harmful, however, so that water that is fit to drink is as common as really pure water is rare. So that, generally speaking, the question of a good water supply is merely a question of being willing to spend the money necessary to obtain it. Hence there ought to be no community in the United States that does not have a plentiful supply of perfectly wholesome water.

Anything but wholesome, however, is the quality of the water that all too often we actually get. Dr. F. W. Shumway, reporting on water conditions in Michigan, says in part: "Of the ninety-nine replies received, 79 per cent reported the water as good, 11 per cent as fair, and 10 per cent as of bad quality. . . . The replies from 124 localities indicate that in 43 per cent of these localities the public water supplies are in danger of contamination." Dr. Q. O. Sutherland, discussing water conditions in Wisconsin, says that in his state "nearly every stream used for any kind of supply is contaminated to some extent by sewage." Health Commissioner G. A. Bading, speaking of Milwaukee's water supply, says that most of the city's water comes from Lake Michigan, but that there are still 1,000 wells in existence, 91 per cent of which have been shown to be contaminated. Lake Michigan is the source of water for many other towns near it. One of the tributaries of Lake Michigan is the Grand Calumet river. And here is what Health Commissioner W. A. Evans, of Chicago, has to say of the Grand Calumet: "The greater part of the sewage from the business and residential districts (of Hammond, Ind.) empties into the Grand Calumet, which, as it flows through Hammond, is almost unrecognizably vile and putrescent. And this stream empties into the lake only 3,000 feet from the waterworks intake." Dr. Edward Bartow, analyzing conditions in Illinois, says that "an examination of the untreated lake water shows that unsatisfactory water is frequently delivered at Evanston, Lake Forest, Glenview, North Chicago, Waukegan, Wilmette and Winnetka. . . . And that the water supplies of all cities which use unfiltered lake water are shown to be impure at times." And this condition of the water supply may be taken as typical of the entire country. A very considerable proportion of our drinking water is absolutely unfit for human consumption.

Criminal negligence is the sole and only cause of such a condition. We dig a cesspool and a well in the same yard, and the contents of the one seep through the earth into the other. We place a privy vault a few feet from our well hole, and the rains wash the filth from the former into the latter. We defile the surface of the ground so that every rainstorm sweeps the defilement into our streams. Did you ever stand at the edge of a barnyard and watch the rain falling from the roof of the barn and pig pen to the manure piles below, slowly accumulating in pools of reddish black, and draining away into a nearby stream, and so on into some one's drinking water? Or have you ever stood by a river bank and watched a sewer belching forth its infinitely more harmful human corruption? The idea of drinking such nauseating stuff is not pleasant; but that is exactly what millions of us are doing. Like the dog, we have turned to our own vomit. For, to quote Theodore Horton, Chief Engineer of the New York State Health Department, "We pump filth into a stream by one pipe, and by another pipe we pump it out again to drink."

Let me give you some concrete instances of how our drinking water is defiled. In rural New York inspectors from Ithaca found a farmer, who patterning after Hercules' method of cleaning the Augean stables, had built his barn directly over a large brook, which carried away all his stable manure. This brook was one of the sources of Ithaca's water supply.

Along the valley of the Susquehanna there

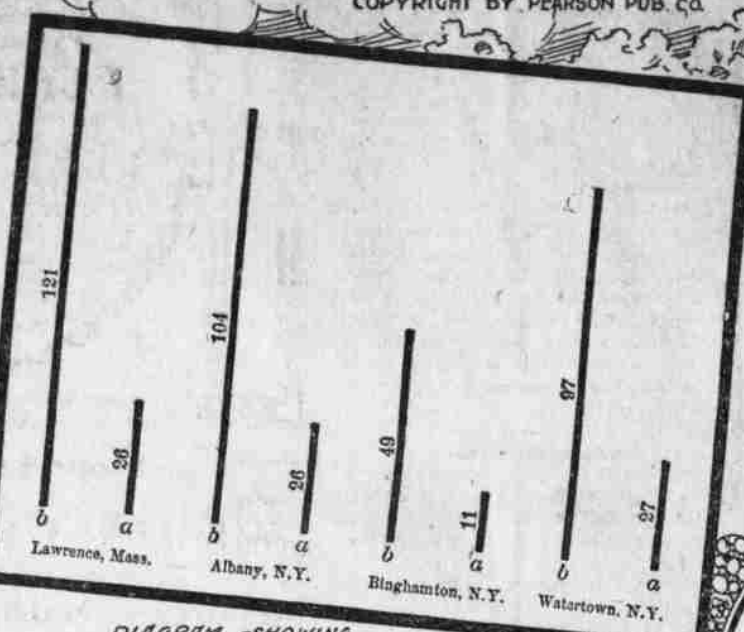


DIAGRAM SHOWING HOW SUPPLYING A CITY WITH GOOD WATER LESSENS SICKNESS AND DEATH

is a string of good-sized towns—Plymouth, Wilkes-Barre, Wyoming, Bloomsburg, Nanticoke, and others, all of which empty sewage into the river, and a number of which take their drinking water direct from the river. Wilkes-Barre does, and its pumping station is on an island in the river. When the stream overflows, as it does every spring, the pumpwell is flooded with the foulest of water—the rolled river flow containing suspended sewage and the reeking, sulphurous waste of coal mines. They make an effort to clean this pumpwell. Perhaps they succeed and perhaps they do not. The point is that the expenditure of a little money would protect the pumping station from inundation.

New York state has the same tale of pollution to tell. Albany, Cohoes, Dunkirk, Lockport, Niagara Falls, Ogdensburg, Oswego, Tonawanda, Watervliet, and other cities drink river water that is grossly polluted by the sewage of cities farther upstream. And I have seen dozens of photographs of filthy cow-sheds and barns, the drainage from which polluted the watershed for New York City.

In Illinois fifteen towns north of Chicago empty sewage into Lake Michigan, and nine of them draw their drinking water back from the lake. And what is true of Pennsylvania, New York, and Illinois, is also true of other states. Particularly is it true of the south. From the Atlantic to the Pacific, from the Gulf to the Lakes, our people are needlessly drinking polluted water.

What is worse, water pollution is on the increase. "With the rapid growth of our population," says Alec H. Seymour, Secretary of the New York State Board of Health, in a recent bulletin, "the defilement of our streams also increases. Some of our finest streams and lakes are being rendered unavailable for boating, bathing, fishing, and domestic use. They are of no value except as cesspools."

Typhoid fever one cannot contract without taking into one's system germs that have been voided by a typhoid patient. These germs get into the body through the mouth, pass through the stomach into the intestines, and are carried through the body by the blood. They leave the body through the bowels and in the urine. Sometimes infection is carried by contact or through vegetables and milk, but the common channel of typhoid transmission is through our water supply. "In order that germs could find entrance into drinking water," to quote Dr. Howe again, "there must have been carelessness in caring for the body wastes of previous victims." And this carelessness, as we have seen, consists for the most part in allowing our water sources to be polluted with sewage.

In consequence, typhoid, winter cholera, and diarrhoea are most prevalent along water courses used for both sewage disposal and water supply. Conversely the typhoid rate of any town continuously using a given water supply fairly represents the sanitary quality of that water supply.

The truth of this will be seen by a comparison of the typhoid rates of towns using clean water with the rates of towns using polluted water. In Michigan, for instance, Allegan, a town of 2,795 population (in 1904) with a pure water supply, had, between 1889 and 1906, 32 cases of typhoid and 4 deaths. South Haven, a town of 2,767 inhabitants, with water drawn from Lake Michigan within 100 feet of a sewer outlet, had in the same period 245 cases and 24 deaths. Manistee, with 12,320 population and pure water from wells, had during these same years a typhoid rate of 15 per 100,000 population; whereas Menominee, with 10,666 population and polluted water from Green Bay, had a typhoid rate per 100,000 of 84. Hartford, Mich., with 1,246 population and impure well water, had, between 1889 and 1906, 24 typhoid cases and 7 deaths; whereas Montague, with 1,021 population and pure well water, had in the same period only 5 cases and 3 deaths. Again, Benton Harbor, with pure water from deep wells, had a death rate per 100,000 of 17.8; Grand Haven, with pure well water, a rate of 13.8; and St. Joseph, with pure lake water, a rate of 12.8; whereas the following New York towns using polluted river or lake water had for ten years—1899 to 1908—these typhoid rates: Lockport, 48.4; Oswego, 49.4; Ogdensburg, 54.6; Cohoes, 54.3; Niagara Falls, 122.9; and Pittsburgh, using polluted river water, had a typhoid rate, from 1900 to 1907, that averages 127 per 100,000.

Before the typhoid rate of cities that have been scourged with epidemics, the high typhoid mortality of such cities as Pittsburgh and Niagara Falls dwindles into insignificance. In Watertown 44 out of 582 cases were fatal; in Ithaca 82 out of 1,350; in Pittsburgh 432 out of 5,265. In Plymouth 114 out of 1,104 per-

sons died; in Lowell 132 out of 550; in Lawrence 34 out of 141. Of 514 cases in New Haven 73 resulted fatally. Butler had 56 deaths and 1,270 cases. In Scranton there were 111 deaths and 1,115 cases; in Cleveland 472 deaths and 3,443 cases; and in Philadelphia 1,063 deaths and 9,721 cases. In every case the death rate has been terrible, rising, in many instances, to several hundred per 100,000 population.

The U. S. Census Bureau report for 1908 shows 11,375 typhoid deaths in the registration area, and for 1909 there were 10,722 deaths—an average of about 11,000 a year. The registration area includes only 51 per cent of the total population, and does not include the South, where the typhoid rate is very high. In ten southern states the average rate has been 79. "Twenty thousand deaths a year," says Dr. William Guilfoyle, Registrar of Vital Statistics of New York City, "would be a very conservative estimate of the total annual typhoid mortality for the complete census of 1900 showed 3,987 typhoid deaths that year. For the sake of being conservative, however, let us take Dr. Guilfoyle's figures. They are large enough."

The dead, it has long been held, amount to not more than one-tenth of the total number of those stricken. "But recent studies," to quote Mr. George C. Whipple, "indicate only one death in 15 or 18 cases." If we allow one death for every twelve cases—an estimate that Dr. Guilfoyle says is entirely within the mark—we shall have the tremendous annual total of about 250,000 cases. Think of it—a quarter of a million people yearly stricken with typhoid!

Recall the largest parade you ever saw—say one with 25,000 troops in line—and think how those stricken ranks marched past hour after hour until your eye grew tired of watching them. Then multiply that parade by ten, and imagine what an enormous army 250,000 persons would make. That is exactly the size of the army, recruited anew every year, that this country forces to fight—typhoid fever.

Like any other army, this army, too, costs money. In this case, though, the cost is in the form of economic loss. Statistics compiled by the Connecticut Board of Health show that typhoid carries people off in the years of their greatest earning capacity, 41 per cent of the deaths occurring to persons between the ages of 20 and 40, and 60 per cent to persons between 10 and 40.

The economic loss thus caused reaches a staggering total. The cost of the epidemic at Plymouth, it is shown by Professor Mason, amounted to more than \$115,000, divided as follows: Loss of wages of those who recovered, \$30,020; Cost of caring for the sick, 67,000; Year's earnings of the dead, 18,419.

In making this estimate, however, allowance was made for the loss of only one year's earnings. An examination of an insurance mortality table shows that the man who dies before he is forty dies before his time. Hence his death represents a loss, not of one year's income, but of many. Five thousand dollars is the sum at which a life is usually valued in reckoning economic loss. The typhoid loss is based only on the number of those who die. As Mr. George Whipple points out, there is an added loss occasioned by non-fatal typhoid illnesses that should also be taken into account. The average period of typhoid convalescence, as figured from 500 cases in a Pennsylvania hospital, is 43 days. Hence loss of wages plus cost of medical attendance would easily average \$100 for every person who recovers. If ten recover for one who dies, then an extra \$1,000 must be added to the \$5,000 allowed for each death, making the total economic loss caused by every typhoid death \$6,000.

Figured on this basis the loss to many communities amounts to millions of dollars yearly.

Take Pittsburg, where, as we have seen, the typhoid rate was 127 per 100,000 population. Pittsburg is a city with a population in excess of 350,000. Hence its annual death toll from typhoid must have amounted to 444. At \$6,000 a life, this death toll will cost Pittsburg \$2,664,000 a year, or \$26,640,000 every decade. And the loss to the entire country, figuring the typhoid deaths at 20,000, reaches the astounding total of \$120,000,000 a year, or \$1,200,000,000 every decade.

This estimate, however, is without question too conservative. Mr. Allen Hazen, an eminent American engineer, says in his book, "Clean Water and How to Get It," that the reduction in the number of deaths in five cities, brought about through water purification, amounted to 440. Improved general sanitary conditions, he says, were responsible for 137 of the 440 decrease. The typhoid reduction amounted to only 71. The reduction in the number of deaths from other causes amounted to 232—three times the typhoid reduction. If this ratio of deaths due to water holds good generally, then our typhoid deaths are only a small part of the deaths due to bad water.

That three-quarters of the typhoid deaths are due to water Mr. Hazen himself declares. That three-quarters is referred to in the first paragraph of this article as the "fifteen thousand needlessly slaughtered each year by polluted water." Because, to quote Mr. Hazen, "three-quarters of the typhoid deaths could be prevented, and thereby could be stopped this needless loss of vital capital that is going on year after year."

The way to save that three-quarters, then, is by being careful, which in this case means by providing pure water. As Mr. Hazen puts it, "By filtering all the water supplies of the important cities of the country, and by instituting other necessary sanitary reforms."

As proof of this let us see what has happened to the death rate in those localities that have purified their water supplies. The typhoid rate of Bensenville for ten years averaged 61.9 per 100,000 population. In 1908, after the water was filtered, it fell to 30. Hudson changed from Hudson river water to a pure supply, and the rate fell from 59.2 to the ten-year average—17.1. Poughkeepsie's rate used to average 112. In 1907 the filtration plant was improved, and the rate fell to 34.5. In Albany the ten-year average before filtration was 38.8. Since filtration the ten-year average has been 22.2.

In Pennsylvania, Pittsburg had a typhoid rate, according to Health Director E. R. Walters, that from 1901 to 1907 averaged 127. In 1907 the city spent \$6,500,000 for a filter system. During the three years since, the typhoid rate has been 31.9—a decrease of more than 75 per cent.

Chicago affords an even more striking example of the benefit of purifying the water supply. In 1891 Chicago's typhoid rate was 173.8 per 100,000, the highest average typhoid rate in the civilized world. Chicago purified its water by building its wonderful drainage canal to keep its sewage out of Lake Michigan. In 1908 Chicago's typhoid rate was 15.6—a reduction of 91 per cent.

Excellent as these achievements are, there is a possibility of an even greater reduction in the typhoid rate.

The methods of water purification are various. Undoubtedly filtration comes first; but filtration is not infallible.

Another method of purification is the use of huge storage reservoirs. Water is a poor medium for disease germs, and in it they die quickly. To quote Mr. Whipple again: "The typhoid bacillus does not multiply in ordinary drinking water. On the contrary the cells die. . . . Ultimately all the cells die. The rate varies greatly. In some experiments all died in 3 to 5 days. In others germs lived a month. In very cold water mortality is more rapid."

Hence if water can be impounded in large reservoirs and held for a time, it tends to purify itself. Sewage disposal is fully as important as water purification—that is, for any purpose except the saving of human life. If property is at stake it is indispensable.

The problem of clean water is evidently not a difficult one to solve. No nation has a finer supply of water than we have.

At the least you can guard the water that comes into your house. See that you get fresh water from the mains, and not water that has stood for hours in the lead or brass pipes within the house. House filters are plentiful, but few of them are efficient. They are merely strainers. Don't put ice in your water. It may contaminate it. Your great safeguard is in boiling your water. Particularly is this necessary in the late winter, when typhoid epidemics so often break out.

NURSE PRO TEM

By MARY EASTWOOD KNEVELS

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On his knees in the mud under a driving rain Robinson carefully examined the overturned car. Lydia, his coat wrapped round her, sat on one of the cushions under a tree and wept. She was unhurt but unnerved from the result of the accident which had occurred—she knew—entirely through her own reckless driving. She recalled Robinson's quietly uttered warning just before they had turned that last corner where they had lost the tire—it was the only thing he had said since she had interrupted his stammering, somewhat abashed, declaration of love by an abrupt and scornful, "No!"

Robinson rose from his knees and came to her. "We'll leave the car where it is," he said, "and go on a bit till we find a house. Come, can you stand?"

He helped Lydia to her feet and they trudged along the road half a mile or more till they came to a small white house, the only habitation in excess of a dozen chickens huddled on the back steps for protection against the rain which still fell in torrents. There was no bell and Robinson knocked in vain.

"There can't be any one at home," sobbed Lydia. "Oh, dear, what shall we do?"

"Don't worry." In another moment he had found an unfastened window, crawled in, and opened the back door for Lydia. She entered a cleanly whitewashed kitchen with a stove, a dresser, and an old cloth covered table for its principal furniture.

Lydia smiled through her tears. "Oh, I'm so glad to get somewhere out of the rain," she said.

"Evidently no one's at home," said Robinson, "and I came in the regulation way." He showed her the key hanging on a piece of string just outside the door. "Now, take off that wet coat," he ordered, "and make yourself as comfortable as you can. These good people won't object. By Jove, I've a mind to make you a cup of tea while we wait—I see there's a

and a twist, made him a beautiful rabbit which hopped.

The baby stopped crying and gurgled with joy. As Lydia watched Robinson in his shirt sleeves in the homey kitchen playing with the fat, red-cheeked baby, she hardly knew him for the same ultra-fastidious Englishman she had danced cotillions with, snubbed, teased, almost considered a coward because he had disapproved of a girl running her own car. All at once it came to Lydia that he was made of better stuff than she was.

Robinson, with the baby balanced on his shoulder, was filling the kettle and setting it on to boil. "I'll fetch up the milk from 'down cellar,'" said he, "but first I'll step out to the barn. You watch him till I come back, please."

Left to herself, Lydia had the brilliant thought of setting the table. By the time she had collected cups, saucers, plates and a bowl for the baby Robinson returned bearing cold ham, butter, and a pitcher of milk.

"The table's ready," she said gaily. "Where's the baby?" asked Robinson.

He was gone. After an anxious search Robinson found him in the sitting room wood box and carried him back to his high chair at the kitchen table, while Lydia, much ashamed of herself, made the tea.

"There's a good horse in the stable," said Robinson as they sat down, "and one of those—er—buggies. But of course we can't leave this poor little chap here alone, and we can't take him with us."

"Good heavens, no," said Lydia. "Will you take sugar in your tea? What do you suppose these people will think when they get back and find us making ourselves at home?" "Oh, you leave that to me," said Robinson easily. "I'll explain." He broke a piece of bread into the baby's bowl of milk and sprinkled sugar over it. "By Jove," said he, "we are rather snug here, aren't we?"

He beamed cheerfully upon Lydia who in his heart agreed.

The comfort of the simple meal was not spoiled by the coarse china, the old cloth, or the presence of the ridiculous baby spilling milk all over his bib. There they sat in the cozy kitchen like one family—and the face she bent low over her place went scarlet at the thought. Coupled with the lateness of the hour and their long distance from home the situation was becoming embarrassing, and yet—and yet—she was enjoying it!

"You don't know how pretty you look with your hair like that!" said Robinson suddenly. He drew his chair closer to Lydia's, but his tender speeches, if he had intended to make any, were destined to be interrupted for the second time that day. A boy's head was thrust through the window. "Geel!" said the head. "There's folks here, Minnie, 'n' they've got baby 'n' they're eatin' supper off'n our things!"

Minnie, a fourteen-year-old girl, hustled into the kitchen, with Johnny behind her. Explanations ensued. It developed that Johnny had been "swimming."

"An' baby would have been all alone if you folks hadn't come," said Minnie, her maternal heart wrung at the thought. I don't know how to thank you."

"By letting us borrow your horse and buggy," said Robinson promptly. Arrangements were soon made for their departure. Before Lydia stepped into the buggy she stooped and kissed the baby's very dirty little face, then she and Robinson shook hands with Minnie and Johnny, and drove off toward the nearest railroad station.

"I'll never run a car again," said Lydia mournfully, as they passed the wreck at the side of the road.

"Oh, yes, you will," said Robinson cheerfully, his arm stealing around her. There was a moment's silence. "Lydia," stammered Robinson at last, "could I—may I—ask you something all over again?"

And this time he was not interrupted.

Wasted Sarcasm.

After a week in the country a prominent lawyer returned to town, determined to stay during the summer. But before coming home he had the satisfaction of telling the keeper of the "real old country boarding farmhouse" just what he thought of things. "There is one thing on your table," said the lawyer, "which is not to be excelled by the best hotels of New York or Philadelphia." "What is it?" asked the farmer. "The salt," answered the attorney, with a fine display of biting sarcasm. "Well, I'm glad you liked it," returned the farmer. "It's the best Jimsons' keep, 'n' I ain't pertickler about the price."

SEEN ON A COUNTRY ROAD

Pleasing Proofs That If You Stray Outside the City You Find Real Friendliness.

Now it is an age of hustle, of forgetfulness, of selfishness—everybody is too busy with his own self centered ideas to think of any one else. Perhaps so far you who see only the pavements, the office buildings, the sun-swept streets, and noise-filled environs of down town. But stray away once, and perhaps there'll come a new view of life.

Two men strayed out upon the Raytown road the other day. It was dusty. It was hot; the sun blazed as strong as though thrown through a giant magnifying glass. Suddenly, from behind, there came a rush and a puffing. A motor rushed past—and stopped.

"Hey!" called the owner, "Jump in; the back seat's empty!"

The two men did so, and began to observe. A half mile further down the road a spring wagon was wobbling along with rickety uncertainty.

Then the driver leaned forward as if trying to jockey the horse into a trot. The quarry was just ahead—a man, his wife, and four children, all walking. The rickety conveyance overtook them and stopped. The woman smiled and climbed up on the seat, while the husband stowed the children in various parts of the wobbly little wagon. However, there arose a difficulty. The load was too heavy for the horse.

"I'll get off," said the husband, handing the smallest child to his wife.

"You'd do nothing of the kind," the driver answered hurriedly. "I'm tired of riding, anyhow."

And so it was all along the road. Everybody said "hello" to everybody else when they passed. There was always a smile and a bow of the head, and perhaps a hazard on the weather. And yet, from one of the hilltops the towering buildings of down town were in plain sight—Kansas City Star.

Didn't Get the Right Cue

Tom Keene's Experience With the Local "Sups" Who Had Played With McCullough.

When Tom Keene took long tours through the northwest, where tragedy is still in favor, he used to keep his company down in numbers on account of the jumps and the high railroad fares, writes Drury Underwood. There were various ways of doing this, such

as by doubling and by putting a tin suit on the electrician now and then. One play had a long cast, however, and the advance agent was instructed to pick up some local man for one of the "bits." Keene arrived in a one-night stand and made his way to the theater to meet the recruit for the play in question. He introduced himself to the manager and explained the situation. The local dignitary said:

"That has been arranged, Mr. Keene. Jones, the house property man, is going to play the part. I'll send for him." Jones appeared presently. He yawned and stretched his arms continually, putting two or three gaps in every sentence. The part consisted of two lines, but on them hung the vital situation of the play. Keene stoned Jones up for his wardrobe and then asked him if he was ready to rehearse. "No," said Jones. "I played the part with McCullough twice." That seemed promising and Keene was sat-

isfied. The particular scene of the performance came and Keene, looking into the wings, saw Jones yawning and stretching. He gave him the speech for his entrance, but Jones did not budge. He repeated it without success and then had to take the scene, which fell flat, ruining the performance. Keene came off the stage in a fury. "Why didn't you come on when you saw me waiting there?" "Didn't get my cue," said Jones. "I gave it to you twice." "Not the cue McCullough gave me," "What cue did

he give you?" "Come on, you Idaho sausage."

It Seemed So. Geraldine—What is your business? Gerald—I am a gentleman. Geraldine—Are you on a leave of absence just now?

Experienced Advice. "I guess I can cook up a story to explain my doings to my wife." "If you do, it will result in a family squall."